# THE MARINE RECORD.

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## LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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## A TRIANGULAR COLLISION CASE.

Three cases are on trial in the United States District Court at Boston, Mass., before Judge Nelson in which the court is asked to determine the facts of a collision which took place on the morning of Sept. 11, 1892, at Fall River between the schooner Benjnmin A. Van Brunt and the steamers Providence and Pilgrim of the Old Colony Steamship Co. The owners of the Van Brunt have brought a libel in which they are joined by the Staples Coal Co., of Fall River, owners of the cargo, in which it is alleged that the schooner was run into and sunk by the steamer Providence. The owners of the schooner and cargo allege that the collision was due to the negligence of those on the steamer in running too fast in a fog and striking the schooner, which was at anchor. The owners of the Providence allege that the collision was due to the negligence of those in charge of the schooner in anchoring in an improper place, and that the steamer was damaged to the extent of $45,000. The owners of the steamer Pilgrim also claim $3,000 damages for injuries to that steamer, which collided with the schooner the same morning, the allegations of negligence on the part of the schooner being the same as in the case of the Providence.

## NOTICE TO MARINERS.

LAKE ERIE.—NEAR HURON, OHIO.—REPORT OF REEF.—A rock is reported by Captain George W. Shepherd, Huron, Ohio, of the tug F. W. Bacon, on which he found scant 11 feet of water. The rock lies about 13 miles N. ¼ W. from Huron pier, and is from 10 to 12 feet square, with 40 feet of water around it. The above information cannot be depended upon, but Capt. Shepherd has been requested to find the rock and locate it accurately by bearings if possible.

## A WATERWAY TO THE COAST.

There has been telegraphed out from Duluth to several newspapers, during the week, a story to the effect that at the Deep Waterway Convention, held this summer at Toronto, a special secret committee was appointed without the knowledge of any one but the higher officers of the convention, this committee consisting of Sir Oliver Howland, of Toronto, Mr. Frank A. Flower, of West Superior (secretary of the executive board appointed by the convention), and Sir Thomas Greenaway, of the Dominion Government, had prepared a plan in brief as follows: That the United States and the Dominion of Canada should enter into an agreement whereby the latter would cede to the former the perpetual right to use all its canals from the Atlantic to the lakes, for all vessels, commercial and naval, provided the United States would assume the expense of maintenance and repairs to the system, the agreement to be ratified by the British Parliament. It was further explained that some restrictions in the matter of naval vessels would have to enter into the treaty. The story further stated that the committee were about to proceed to England to present the case to Lord Rosebery, and that they would then take what steps might be necessary to bring the matter before Congress and the President. The expense to which Canada has been put in the construction of her canal system is estimated at $60,000,000—more than she can afford—and the cost of maintenance by the United States at $1,000,000 per annum.

The article closes as follows: "The canals which would be thrown open to the commerce of the United States by the signing of a treaty on this matter are the Lachine, at the Isle of Montreal; the Soulanges, the Cornwall, the Faran Point, the Rapids Plat, and the Gallop, in the St. Lawrence, and the Welland, around the Falls of Niagara. They will give deep water navigation from Liverpool to Duluth, a distance of 4,618 statute, or 4,230 geographical miles, and to the Canadian haven of Port Arthur, on Lake Superior, 4,494 statute miles, making one of the grandest and most important waterways on the globe."

One of the detracting points in this magnificent train of thought lies in the fact that besides the slight formality of signing a treaty, such as is mentioned above, the work of constructing the Soulanges Canal, one of the series mentioned, will not be completed for some three years yet. When that is finished, Canada will theoretically have a 14-foot waterway from Lake Erie to the sea. Practically, masters of vessels say it is rarely that a boat drawing 14 feet can get through the Welland Canal. When the Deep Waterway Convention was in session, the Board of Trade of Toronto made strenuous efforts to have a resolution adopted urging the Canadian Government to hasten the work of completing these canals, but the convention, as it had been called to consider the question of a deep channel, or 20-foot waterway, declined to entertain the resolution, because it was not germane. In view of this fact it seems very strange that a committee should have been appointed to procure an international agreement on a 14-foot waterway, that would be of very little use to the lake boats, most of which can load down to 16 or 18 feet, and $1,000,000 a year would be a rather high toll for all the tonnage which could avail itself of such an arrangement. It also seems strange, in view of the fact that a special executive board was appointed to consider the most advisable and feasible route for a 20-foot channel from the lakes to the seaboard, in American or Canadian territory. There will be a meeting of this executive board in Chicago within a few days, at which further developments in the real line of work proposed by the convention may be expected.

In regard to the dispatch above mentioned, Mr. Flower, who was mentioned as one of the secret committee, states: "So far as we know, the vessel owners have made no such move. Our association, composed almost equally of Canadians and Americans, is working to have the two countries unite on an equitable basis to construct ship channels from the Great Lakes to the sea, and we hope, before there shall be any conflict, to have before Congress and Parliament a complete report on the entire subject from an international monetary as well as engineering standpoint—the canal or canals to the sea to be free and neutral, a part of the high seas, in fact, the cost of construction and maintenance to be borne in equitable proportions according to population or commerce by both nations. The alleged steps by ship owners, I think, are entirely mythical, as many small owners are opposed to deep channels and big locks everywhere, believing that such improvements would enable the larger craft, which are constantly increasing in number, to drive the smaller ones out of business.

THE engineers sent out under congressional authority, to make a preliminary survey of a route for the proposed 22-foot ship canal from Lake Superior to the Mississippi River, near St. Paul or Minneapolis, have completed their work. Their report will be forwarded to the Secretary of War, and it is expected will be laid before congress in his annual report next month. The total length of the proposed canal is about 162 miles. The cost, it is thought, will not exceed $90,000,000.

# NEWS AROUND THE LAKES.

## CHICAGO, ILL.

*Special Correspondence to The Marine Record.*

The Graham & Morton Transportation Co. chartered this week the steamer Petoskey, of the Northern Michigan Line, to run in the winter route between St. Joseph and Milwaukee with the steamers Chicora and R. C. Reid in handling the immense transfer freight business of the Big Four railroad. The steamer begins her run December 10 and has a carrying capacity of 800 tons, making a total carrying capacity for the line of 3,000 tons.

A larger business was done in grain freights on Monday than any day for several weeks. Should the Buffalo corn rate go to 2 cents by Wednesday, as several vesselmen expect, a number of steamers whose owners had intended placing them in winter quarters here, will make another trip.

The men employed by the Chicago Ship Building Co., on the two big steel schooners under construction in its yard on the Calumet, are back to work on former terms. Of late there has been a good deal of dissatisfaction among the workmen which culminated Saturday in a general meeting. The company stopped work entirely that day, when the situation was explained to the men and they learned that it was no time to go on a strike and that ended the movement.

The schooner Sunrise was sold, this week, on a basis of $6,900 to a Buffalo owner who will sail her himself.

The steamer Osceola will go on the winter route between Milwaukee and Grand Haven this week. She takes the place of the steamer Roanoke, which was burned on Lake Superior. The steamers Mary Boyce and Mary McGregor have gone into winter quarters here.

The old scheme of collecting large sums from vessel owners for dock and wharf rent is being tried again this fall. With the prospects of a big winter fleet ahead, some speculators are trying to secure control of all the available docks and then by getting big prices from vessel owners, clean up a nice profit out of the deal. The same scheme last winter netted about $5,000. Vesselmen seem inclined not to be victimized another year in this way and it is probable that the speculators will have trouble in re-leasing the docks that they control at any big advance.

## CLEVELAND, O.

*Special Correspondence to The Marine Record.*

Mr. Harvey C. Beeson, publisher of the Inland Marine Directory has been in the city for the past few days on business connected with his publication and intends remaining here until Monday, Dec. 3. The issue of the directory for 1895 will be from press early in April next. While the general lines of the new issue will follow the style of former annuals there will be several new features added to make the work still more valuable to the mercantile marine of the lakes.

The steamer George Presley and the schooner Nellie Redington will go into winter quarters at this port as soon as they are discharged of their cargoes.

The steamer N. K. Fairbank will lay up in the Ohio basin, Buffalo.

The schooner Senator Blood, which was caught in Saturday's gale off Lorain, was towed to this port on Monday by the tug Alva B.

The steamer S. S. Curry was not sheltered under Long Point Saturday night, as reported. She made the run from Buffalo to Detroit in 22½ hours.

On Tuesday the employes of the Vessel Owners' Tug Line presented Capt. W. A. Collier, manager of the line with a diamond stud. The presentation was made by Lee Brogan, Capt. Collier's assistant. The affair was a surprise to Capt. Collier, who, however, heartily responded to the occasion. The tugmen organized a social club and will give a ball next month. Capt. John Moffett was elected president, M. Farrell, vice president, and Lee Brogan secretary and treasurer. Capt. Edward Kennett, George Downie, M. McCormick, Thomas Murphy and Henry Hobson will make arrangements for the annual dance.

Capt. John Hall, manager of the American Steel Barge Co. at this port, says that all of their tonnage is yet at work except the small barge 101.

The last of the coal charters will be made this week, a few more cargoes having to go to Lake Michigan.

A pier at Erie street out into the lake is one of the improvements which the city will carry out at an early date, the contract for its construction having been approved by the city council this week. An energetic committee on the project for widening the river is also making good progress.

A round trip charter from Buffalo to Duluth was made here this week for the sum of $3,500 net. With a favorable slant this ought to leave a fair margin to the credit of the vessel.

Mr. M. A. Bradley visited Buffalo this week.

Shipping Master A. R. Rumsey left for New York on Monday, on his trip around the world.

The steamer Briton will follow the Corsica in the Cleveland dry dock this week for repairs and then proceed on to Ashtabula to lay up for the winter.

Mr. J. F. Pankhurst, general manager of the Globe Iron Works Co., received the following letter on Tuesday from Capt. W. H. Campau, master of the steamer Globe, from Buffalo: "I arrived this morning from Lake Superior, with a cargo of 2,900 tons, on a draft of 14 feet 5 inches forward and 14 feet 8 inches aft. Arriving at the Soo, fell in with steamship Harvey H. Brown, which passed Detour an hour and twenty minutes ahead of us. I reached Ft. Gratiot thirty minutes ahead of her. I did not go into the river until daylight; the Brown passed in ahead of me. I passed him again in St. Clair River and I stopped at Detroit a few minutes. I passed him again on Lake Erie and beat him fifteen miles to Buffalo. The Globe is what I call a good ship in every particular and is much faster than I expected she would be. In fact, there are very few freight boats that can run with her. Everything is all right aboard of her and in good order. I leave again to-morrow for Lake Superior and expect to get back all right."

Capt. Cummings, of the steamer Corsica, lately inspected the new steel steamer Globe, and he says that it is the peer of anything on the lakes.

## DETROIT, MICH.

*Special Correspondence to The Marine Record.*

The Frontier Iron Works will build to the order of Capt. James Davidson of West Bay City two triple expansion engines. Diameter of cylinders 20.32 and 54 inches by 42 inches stroke. Duplicates of the engines now running in the Shenandoah.

The underwriters' meeting to arrange for the inspection of vessels to be used for the winter storage of grain adjourned until Dec. 11, when this and other matters requiring attention will be taken up. If the class of the boats are all right why should they be surveyed again is the query that some owners are trying to find out.

The dredges on the deep water channel at Bar Point stopped work for the season on Monday. Starke's dredges will winter at Detroit. Smith's three dredges will go to Cleveland as soon as the weather moderates.

## BUFFALO, N. Y.

*Special Correspondence to The Marine Record.*

The northwest gale incaeased to fifty miles an hour here on Tuesday, but no damage to shipping has been reported as yet. The wind is still heavy and the weather is much colder.

The steamer R. P. Ranney is here with wheat from Port Arthur which is supposed to be badly damaged. She was aground several days at the mouth of the Kaministiquia Rixer on account of low water there.

The steamer W. H. Gratwick noted a protest against wind and weather on her arrival here this week, as it is thought that some of her freight may be damaged by the hard storms that she passed through on her down trip.

The annual meeting of the Lake Carriers' Association has been fixed to take place at the Cadillac hotel, Detroit, beginning January 8. Already there is an assurance of an unusually large attendance of vessel owners from all points on the lakes, and many matters of vital importance to the marine interests will be presented. By the rules of the association, the president cannot be re-elected, and there is much interest as to who will be made the head of the organization for the next year. If William Livingstone, Jr., of Detroit will accept the office, he will doubtless be elected without opposition. This city, however, wants the presidency if Cleveland is given the "go by."

Word was received here that the steamer Servia, coal laden, from this port to Chicago, went ashore at False Presque Isle Reef early Tuesday morning; her consort, the Moravia, came up behind her and struck the Servia a hard blow, doing considerable damage. The Middle Islend life-saving crew went to the steamer and the Elfin Mere released the Servia in the afternoon.

Mugridge Bros., owners of the yacht Cypress, have tied up the schooner Hattie Wells on a $120 libel, on account of a collision here last Friday in which the yacht was badly smashed. Capt. Elliott, of the Wells, claims that the yacht was at fault and refuses to settle.

## MILWAUKEE, WIS.

*Special Correspondence to The Marine Record.*

The receipts of coal in Milwaukee by lake this season promise to be unparalleled in the coal trade of the port. Already more coal, anthracite and bituminous, has been received than was entered at this port during all of last season, and cargoes are expected to arrive for nearly a week, bringing in thousands of tons more. The receipts show that the great strike of the coal miners has not affected the trade in the way expected. Ever since the strike ended there has been heavy receipts of soft coal, which is used almost exclusively for manufacturing purposes, thus evidencing a wonderful picking up in manufacturing. Last week there had been received 84,658 tons of coal above the entire receipts of last season. Of this excess 69,713 tons was of the hard amthracite and 14,945 tons of the soft or bituminous coal. Had it not been for the great coal strike, dealers say these figures would have more than doubled. The great increase has been in hard coal, owing to the low price at which it has been retailed, encouraging consumers to lay in larger stores than usual for the winter. The receipts from now on to the close of navigation will be heavy, principally of hard coal, the dealers filling up their yards, which have been nearly depleted by the big fall sale, which has been heavier this year than for many preceding years. This is due to a great degree, to the early cold snap. The following table, compiled from the record of receipts at the Milwaukee custom house, shows the coal receipts of both anthracite and bituminous for the past three seasons, the figures for the present season being only brought to date:

| Season. | Anthracite. | Bituminous. | Total |
|---|---|---|---|
| 1892 | 542,273 | 320,423 | 862,696 |
| 1893 | 718,867 | 398,781 | 1,117,448 |
| 1894 | 788,380 | 413,726 | 1,202,106 |
| Total | 2,049,320 | 1,132,930 | 3,182,250 |

## DULUTH, MINN.

*Special Correspondence to The Marine Record.*

The mills made a run last week, though the total product does not show up as high by 6,000 barrels as it would if some of the mills had not been forced down for short intervails for trivial causes. The exact figures are 90,213 barrels, which is 13,131 less than was made in the week preceding, and an average of 15,035 barrels daily, compared with 102,344 barrels made in the week earlier, 80,429 barrels in the corresponding week a year ago, and 37,420 barrels two years ago. During this week which is probably the last of navigation, the mills, barring mishaps, should make close to 110,000 barrels of flour, and they will do it if they run the entire week.

The shipping season is very nearly closed, and vessel room is in brisk demand just now, though it must be said for the lines, that they have been very prompt in placing boats at the mills, whenever it was possible, and no very great wail for vessels has gone up from the millers, so far. Ice in the slips about the harbors has formed from two to four inches in thickness, and the present cold wave is making it still thicker. A mild spell of a week or ten days is looked for yet this fall, and if it comes, a surprising amount of flour will be shipped. Flour is held at an advance of 5 cents per barrel. Still the eastern markets are reported firmer, and it is believed that if prices remain firm, as they no doubt will for a time, a good advance can be realized.

On December 1, the head of the lake mills will abandon the use of the old fashioned hickory hoops for barrels. The flat hoops, they claim, make a tighter package and prevents the sifting of flour from between the staves.

One of the biggest iron deals of this year was closed this week by Louis Rouchleau and Robert C. Ray for the Rouchleau-Ray Iron Land Co. The transfer does not include the timber on the land, the company retaining its control of that. The purchaser is the Fayal Iron Co., one of the Minnesota Iron Com-

pany's branches. D. H. Bacon paid over $200,000 spot cash, the consideration in the transaction. The deal is a good one for both parties. The land is very valuable for iron and can be worked to the advantage.

The expenditures on river and harbor work at this end of the lake for the fiscal year ending June 30, 1894, were as follows: Duluth harbor, including north channel of St. Louis Bay and St. Louis River, $81,526.74; Superior Harbor, including south channel of St. Louis Bay, $73,036.06; Agate Bay (Two Harbors, Minn.) $27,110.66; Grand Marias, Minn., $9,689.75; Grand Marias, Mich., $27,639.62; Ashland, Wis., $47,063.08; Portage lake (Mich.) canal, $36,553.50; Marquette, Mich., $60,812.51; Ontonagon, Mich., $9,559.50; total, $291,374.74.

The total amounts spent on the various projects by by the government are as follows:

Duluth, $767,981.53, of which $88,801.49 was for canal piers, $110,000 for old breakwater long since destroyed and $569,180.95 for dredging. Superior, $630,853.18; Agate Bay $89,222.24; Grand Marias, Minn., $126,159.93; Ashland, $185,144.42; Portage Canal, $48,388.04; Grand Marias, Mich., $255,214.55; Marquette, $463,266.64; Ontanagon, $317,439.72. The amount required for the completion of the present project in Superior's upper and lower harbors is $156,736. "Vessels will not," says Maj. Sears, "use the Superior channel, as long as the shorter and much easier route through the Duluth Canal is in good condition. It is used however, by rafts, and should not be allowed to deteriorate." He recommends straightening and widening it, and also spending $5,000 a year in dredging the sand bar that is annually added to at the mouth of the Nemadji River. The dock line channel from Old Town to Connor's Point has been completed, but should be widened. For Portage Lake Canal, connecting Keweenaw Bay and Lake Superior, he estimated $1,245,000 is needed to put in the proper shape, of which $800,000 could be profitably spent next year. The government bought the canal from the state of Michigan in 1882. It was then only twelve and one-half feet deep. Now it is fourteen feet throughout. The recommendations are for a sixty-foot channel, seventy feet wide, to be later increased to twenty and one hundred feet, new revetments and new piers extending to water thirty feet feet deep in the west end and twenty on the east.

The wonderful Mesaba range is still developing. Over three hundred test pits have been sunk into ore of a depth of from 50 to 170 feet, and an ore body larger than any elsewhere on this range has been uncovered. This ore deposit is from a quarter to three-quarters of a mile wide, and is not less than three miles long. The average depth of the ore appears to be about eighty feet. The magnitude of this deposit, therefore is something beyond computation and belief. Five distinct companies are and have been prospecting with the result that pits and shafts are being sunk with most advantageous results.

The Chandler mine was the biggest shipper in the world this season, over 600,000 tons of ore having been mined and shipped.

It will be something like six weeks yet before the new machinery will be in position at the Lake Superior mines at Hibbing. The mammoth Duplex pump which is being put in has great capacity and is expected to handle the immense volume of water encountered with ease.

Up to Nov. 1, shipments from the Duluth, Missaba & Northern docks at Duluth were 1,240,000 tons. From the Duluth & Iron Range docks at Two Harbors the total on the same date was 1,300,000. It is estimated that the season's total will be: Duluth, 1,300,000 tons; Two Harbors, 1,400,000 tons.

On the Vermilion the cheering words come that full forces will be worked all the winter. The Chandler and Ely has already begun on the stock piles and its manager states that he will have more ore above ground than last spring when it amounted to 350,000 tons. On the Mesaba there will be far more work done than ever before, and the extra labor employed there will to a considerable extent relieve the surplus in other parts of the district. This is caused by the opening of mines that will be in the shipping list next season, but which have not yet been stripped or developed.

It is estimated that 12,500 men are employed at present on all the ranges, which is 500 more than a year ago. Wages are small but average at the surface mines a little more.

During the past week the big Minnesota mine at Tower stopped forwarding ore and is now working on stockpiles. It will probably have 200,000 tons ready by spring, which is about last winter's work. The Mountain Iron on the Mesaba is still shipping but will stop this week, as it is almost impossible to handle the soft ore in the dock pocket and in the cars this freezing weather. The Hale on the Mesaba has closed the sea son with a record of 30,000 tons, and the Biwabik, which was expected to make a big showing the past three months, is stopped with a total of less than 80,000.

## GOSSIP FROM CANADA.

*Special Correspondence to The Marine Record.*

Gradually the winter haunts of the lake skippers are beginning to once more resound with the hearty laughter of the bluff captains at the new yarns brought back by several of their number, which forces home the conviction that the all-too-short season of navigation is almost at a close. Another convincing proof of this fact is in the number of vessels already at this port tied up and stripped for the winter, with the inevitable and dismal looking boards nailed on cabin windows and lying athwart the spokestack's top.

Several of Toronto's prominent masters and vessel men have taken to riding bicycles. Among these are Capt. Crangle, Capt. Harry O. Jackson, Capt. A. Thompson (now in Port Arthur), Barlow Cumberland, J. H. G. Hagarty, Capt. Trowel, and a number of others. Capt. Solomon Sylvester is about to negotiate for a wheel, and the prognostications are that shortly all our vesselmen will be steering on land as well as on the lakes.

Captains complain that much damage is being done by the Americau dredgers in Lake St. Clair flats, who are at present and have been all season making a channel for the deep draught ships. All the material which is dredged out of the new channel, it is said, is towed on scows into Canadian water and dumped into such a position as to block the channel leading into Chatham harbor. Vessels going up the river to Chatham or coming out from that port down will have to make a detour of several miles if present dumping continues. If the scows, say the captains, were towed to the vicinity of Windmill Point before being dumped no inconvenience would result. There is a unanimity of opinion among the Canadian vesselmen that the Dominion Government should at once interfere. Their attention was drawn to the matter earlier in the season, but nothing has been done. The sole desire of the dredgers seems to be to facilitate access to Detroit and to block the approaches to Canadian ports if possible.

The propeller Cuba has gone to St. Catharines to lie up for the winter. During the idle months she is to be thoroughly overhauled.

The steamer Garden City was sold at St. Catherines by Marine Marshal Capt. Boyd to Mr. T. Nihan, of St. Catharines. The figure realized was a fairly good one.

The steamers Rosedale and Algonquin are coming to this port to winter. They will lie at the Geddes wharf.

The propeller St. Magnus is expected from Montreal toward the end of this week. She will be about the last steamboat to come up the lake this autumn.

The schooner White Oak has gone to Oakville to lie up.

## TO REACH THE COAST.

The executive committee of the International Deep Waterways Association met at Chicago on Tuesday. The members present were: A. L. Crocker, of Minneapolis, president: Frank A. Flower, of Superior, secretary; L. E. Cooley and J. S. Dunham, of Chicago, Oliver A. Howland, of Toronto; R. R. Dobel, of Quebec; and Colonel J. H. Davidson, of St. Paul. It was decided to hold the next convention of the association in Cleveland, although the date was not decided on. The committee considered at considerable length the question of co-operation between the United States and the Dominion Government regarding an international deep water channel from the Great Lakes to the Atlantic. Mr. Howland and Mr. Dobel were named as the committee to confer with the Canadian authorities relative to the appointment of an international commission. The committee to confer with the American authorities will be appointed tomorrow.

Plans are matured for carrying on a general educational campaign on behalf of the deep waterways to the sea, interesting commercial bodies, boards of trade, and the general public in advantages to be obtained by openiag up direct communication with the world by deep waterways. Bills were discussed which will be introduced at the opening of the sessions of congress, but the formal draft of the measures will not be decided upon until the next meeting.

The following members were added to the executive board: Edwin H. Abbott, Boston; William Livingstone, Jr., Detroit; Charles E. Wheeler, Cleveland; Dennison B. Smith, Toledo and John D. Chipman, St. Stephens, New Brunswick.

## LOOKOUT.

Capt. James Fraser of the steamer S. R. Kirby, who was taken severely ill at Ashland has so far recovered that he is able to get around again and visit his friends.

The hull of the Canadian steamer Enterprise, which went ashore near Alpena, and was subsequently released by the Gilchrist firm of wreckers has been rebuilt by James Davidson. She will be taken to Alpena and will hereafter serve as a tow barge.

As usual Stannard Rock light on Lake Superior is the first to close for the winter. When the keepers were taken ashore last week, there was four feet of ice on the coffer dam at the rock, and the tower was coated with ice to a height of fifty feet. The keepers say that there was more ice on the rock than they have ever seen before at the same date.

The news comes from Milwaukee that Capt. R. Hayes, formerly of the steamer Argonaut, now in charge of the steamer Rhoda Emily, is the owner of a farm in Minnesota, and when he laid up a year ago it was with the intention of quitting sailing for good. However, not being accustomed to handle the plow, Capt. Hayes permitted his prairie possessions to run to grass, and as a result he found himself in July last the owner of about 150 or 160 tons of as fine hay as could be displayed anywhere. To market the commodity, however, it was necessary to have a hay press, and in order to secure the machine it became necessary to borrow money. This proved to be an easy matter with lenders when they saw how generously mother nature had dealt with the venerable skipper. But while waiting for the press and counting upon a handsome return for his season's labor a prairie fire swept away everything Robert possessed except the bare land. This necessitated his return to the lakes to sail again for a livelihood, and in order to reach Chicago and a remunerative position he was driven to the dire necessity of pawning his wife's jewelry, for he never cared to own any himself, although many of his sailor friends wear anchor chains which bear testimony to the captain's skill in the manufacturing line. Capt. Hayes bears his misfortune philosophically and proposes to try his luck at farming again next season, for, as we are all aware, it is more regalar and profitable an occupation to plow land than water.

## THE SOLAROMETER ON ATLANTIC STEAMERS.

The solarometer, the new instrument of navigation, invented by Lieut. Beelher, of the United States Navy, will be used on the following transatlantic steamers on their next eastward trips: The Campania, of the Cunard Steamship Co., sailing from New York December 15th; the New York, of the American Line, sailing December 12th; the Lahn, of the North German Lloyd, sailing December 4, and the French Liner La Touraine, sailing January 31st.

The instrument has already been placed upon the cruiser San Francisco, which will sail December 5th. A description of the solarometer has already appeared in this paper.

The *Liverpool Journal of Commerce* says: We understand that at the commencement of the new year it is the intention of the White Star Line to appoint a general manager. The gentleman spoken of as the most probable man is Mr. Harold Saunderson, of the firm of Messrs. Saunderson Brothers, of New York, who are the New York agents for Messrs. Thos. Wilson, Sons, & Co., Hull, and other steamships. Mr. Saunderson is well known on the New York Exchange for his genial and commanding presence.

## STEERING AND SAILING RULES.

Act of August 19, 1890, to adopt regulations for preventing collisions at sea, as amended by the acts of May, 28, 1894, and August 13, 1894, and proclaimed by the President of the United States to take effect March 1, 1895.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collisions at sea, shall be followed by all public and private vessels of the United States upon the high seas and in all waters connected therewith, navigable by seagoing vessels.

PRELIMINARY—RISK OF COLLISION.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

Art. 17. When two sailing vessels are approaching one another, so as to involve a risk of collision, one of them shall keep out of the way of the other, as follows, namely:

(a) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(b) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(c) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(d) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the vessel which is to leeward.

(e) A vessel which has the wind aft shall keep out of the way of the other vessel.

Art. 18. When two steam vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are when each of the two vessels is end on, or nearly end on, to the other; in other words, to cases in which, by day, each vessel see the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course; or by night, to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

Art. 19. When two steam vessels are crossing, so as to involve risk of collision, the vessel which has the other her own starboatd side shall keep out of the way of the other.

Art. 20. When a steam vessel and a sailing vessel are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

Art. 21. Where, by any of these rules, one of two vessels is to keep out of the way the other shall keep her course and speed.

NOTE.—When, in consequence of thick weather, or other causes, such vessel finds herself so close that collision cannot be avoided by the action of the giving-way vessel alone, she also shall take such action as will best aid to avert collision. (See articles twenty-seven and twenty-nine, act of May 28, 1894).

Art. 22. Every vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

Art. 23. Every steam vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed, or stop or reverse.

Art. 24. Notwithstanding anything contained in these rules every vessel overtaking any other, shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position, with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel cannot always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

Art. 25. In narrow channels every steam vessel shall, when it is safe and practicable, keep to that side of the fairway or mid channel which lies on the starboard side of such vessel.

Art. 26. Sailing vessels under way shall keep out of the way of sailing vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fairway used by vessels other than fishing vessels or boats.

Art. 27. In obeying and construing these rules due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

[It is understood that these rules will go into effect on the lakes March 1, 1895, though a decision relative to their being enforced on fresh waters is still being waited for from the secretary of the treasury.—ED.]

## AMPLITUDES.

The following approximate amplitudes of the Sun's rising will be given each week in this column during the season of navigation: A second bearing of the Sun may be taken at sunset by reversing the bearings to read west instead of east, as, for example, E. S. E. for a sunrise bearing would read W. S. W. for a sunset, or E. 35° S. to W. 35° S.

LAKE ERIE AND S. END LAKE MICHIGAN LAT. 42° N.

| Sunrise. | Bearing (degrees.) | Bearing (points.) |
|---|---|---|
| Dec. 2 | E. 30° S. | S. E. by E. ¼ E. |
| Dec. 11 | E. 32° S. | S. E. by E. ⅛ E. |

LAKE ONTARIO, S. END HURON AND CENTER LAKE MICHIGAN LAT. 44° N.

| Sunrise. | Bearing (degrees.) | Bearing (points.) |
|---|---|---|
| Dec. 2 | E. 31° S. | S. E. by E. ¼ E. |
| Dec. 11 | E. 33° S. | S. E. by E. ⅛ E. |

N. END LAKES HURON AND MICHIGAN, LAT. 46° N.

| Sunrise. | Bearing (degrees.) | Bearing (points.) |
|---|---|---|
| Dec. 2 | E. 33° S. | S. E. by E. ⅛ E. |
| Dec. 11 | E. 34° S. | S. E. by E. |

LAKE SUPERIOR LAT. 48° N.

| Sunrise. | Bearing (degrees.) | Bearing (points.) |
|---|---|---|
| Dec. 2 | E. 34° S. | S. E. by E. |
| Dec. 11 | E. 36° S. | S. E. ⅞ E. |

With a compass correct magnetic, the difference between the observed and true bearings will be the variation for the locality. If there is any deviation on the course the vessel is heading at the time of taking the bearing the result after the variation is applied will be the amount of deviation on that course.

## TO SECURE FREIGHT FOR AMERICAN BOTTOMS.

A correspondent of the New York *Journal of Commerce* writes to that paper as follows: "In order to restore American shipping to the position it occupied before the Civil War it has been suggested that a rebate of 5 per cent or more be deducted from the tariff duty on goods brought to this country in American vessels, thereby offering an inducement to European shippers to patronize our ships. (This refers, of course, to goods on which a duty must be paid.) Would this course, in your opinion, result in renewed activity in building and enlarging the scope of our mercantile marine?

What action would foreign countries be likely to assume toward us in the event of such discrimination?

Has this course ever been pursued by this government and if so with what result? The following will illustrate the points above referred to:

| | |
|---|---|
| English firms shipping from Liverpool, per annum | $1,000,000 |
| Duty at New York at 40 per cent regular | $400,000 |
| Duty if carried in American bottoms at 35 per cent | 350,000 |
| Saving in duty to shippers (a big inducement to ship in American bottoms) | $50,000 |
| Say freight cost to ship in American bottoms | 25,000 |
| Net saving to shippers | $25,000 |
| Freight paid to American bottoms, or, in other words, income for American shipowners | 25,000 |
| Say English ships carry it for nothing as ballast, income | Nil |
| Net saving to Liverpool shippers | $25,000 |
| Income to American shipowners for freight | 25,000 |
| Net loss in duties to American Government to encourage shipping | $50,000 |

To the foregoing queries the *Journal* says the United States Government long has been, and now is encouraging American shipping, as far as possible, by the device here outlined. The immediate result is that the foreign nation retaliates by similar legislation or in any manner that seems most likely to be effective; the secondary result is the appointment of commissioners, upon one side and the other, to agree upon a treaty which shall put an end to the discrimination. Finally the situation is just the same as if there had been no discrimination, no retaliation, and no treaty. In the existing tariff law provision is made for the distriminating duty in section 14, as follows:

"That a discriminating duty of 10 per centum ad valorem, in addition to the duties imposed by law, shall be levied, collected and paid on all goods, wares or merchandise which shall be imported in vessels not of the United States; but this discriminating duty shall not apply to goods, wares or merchandise which shall be imported in vessels not of the United States, entitled by treaty or any act of congress, to be entered in the ports of the United States on payment of the same duties as shall then be paid on goods, wares and merchandise imported in vessels of the United States."

Every nation whose shipping is of any importance now has a treaty with the United States abrogating the discriminating duties, the collection of the additional 10 per cent is a very rare occurrence, and the statute imposing the extra duty is of no value except for diplomatic purposes.

## AMERICAN FOREIGN COMMERCE.

An interesting presentation of the share which American vessels have in the carrying trade to and from the United States will be made in the forthcoming annual report of the Chief of the Bureau of Statistics, and it will be the first time that such a computation has been made separately for the different countries of the world. The result shows that American shipbuilders and owners have not so much cause for discouragement as to the share which they have in the commerce of the United States with other parts of North America, with certain countries of South America, and with parts of Asia and Oceanica, as has been quite generally understood. The total imports into the United States from the different continents, with the percentage carried in American vessels and the exports from the United States with the like percentage are shown in the following table:

| Country. | Imports. Total. | P Ct. | Exports. Total. | P Ct. |
|---|---|---|---|---|
| Europe | $294,654,601 | 3.9 | $697,866,006 | 2.0 |
| N. America | 141,450,107 | 50.2 | 73,796,833 | 51.8 |
| S. America | 100,147,107 | 14·7 | 33,212,310 | 32.2 |
| Asia | 62,509,778 | 18.7 | 20,609,162 | 16.9 |
| Oceanica | 21,447,343 | 56.9 | 11,857,549 | 44.0 |
| Africa | 3,479,338 | 9.0 | 4,923,859 | 32 3 |
| All other countries | 1,683,253 | 1.3 | 653,426 | 9.0 |
| Grand total | $625,371,527 | 19.4 | $842,919,145 | 8.7 |

The most striking fact in the foregoing table is the small proportion in which American vessels are employed in our trade with Europe. The only country in whose trade with the United States American vessels play any part worth mentioning is France, from which imports were received in American vessels to the amount of $4,887,469 in a total import trade of $47,547,662. The export trade in American vessels to France is a trifle larger in volume, $4,948,241, but is only 4.8 per cent. of the total. American imports from the United Kingdom of Great Britain and Ireland are received in American vessels to the extent of $5,527,281, and exports to the United Kingdom go in American vessels to the amount of $11,829,225, but the percentage is only 5.2 of our total imports from the United Kingdom and only 2.8 of our total exports to that country.

The largest percentage of United States vessels in the import trade from North America is in the cases of Central America and Mexico, the imports from the former country in American vessels being $6,156,302, or 63.4 per cent of the whole, and from the latter country $12,206,-869, or 60.4 per cent. of the whole. The American share in the carriage of imports from the West Indies is $45,-691,375, or 47.4 per cent. of the total imports. British Columbia also sends a large share of her exports to this country in American vessels, and her imports from the United States go in American vessels to the amount of 93.3 per cent. The proportions vary greatly in the South American countries, and would show a much higher average if the large commerce of Brazil in British, French and German vessels were eliminated. The total imports into the United States from Brazil are $79,-360,159, of which only five per cent. come in American vessels, leaving $20,786,948 from other South American countries, of which $10,745,806, or more than 50 per cent. come in American vessels. The United States practically monopolize the carrying trade with the Hawaiian Islands in both directions, and have a large share of that from other Occanic countries.

## LAKE ERIE FISHING INTERESTS.

Of the importance and condition of the fisheries in Lake Erie, Commissioner McDonald says in his annual report:

"Although ranking fourth in area this lake maintains a fishing industry of vast extent and of much greater importance than that of all the other lakes combined, omitting Michigan, which it surpasses by 36 per cent. in fishing population, 49 per cent. in invested capital, 60 per cent, in the quantity of fish taken and 17 per cent. in the value of the catch. The fisheries of Lake Erie are thought to be more important than those of any other body of fresh water in the world and there are few, if any, lakes which have afforded such a history of prolificness of fish life in proportion to their size. To illustrate the relative productiveness of the American waters of this lake, it may be noted that the average value of the catch per square mile of lake surface is over $200, while in no other lake of this system is the average more than $50, and in three of them is much less.

"The fishing population of Lake Erie numbers about 4,500; the amount of capital invested in the fishing industry is $2,816,300; the quantity of fish caught in 1890 was 64,850,000 pounds, having a first value of over $1,000,000. In order to appreciate the magnitude of the work done by the commission in this great lake it is only necessary to glance at the statistics of the number of fish deposited since the commission was organized. In 1876 1,000,000 white fish were deposited in Erie, and from that time until 1891 the number per year varied from 2,250,000 in 1877 to 40,700,000 in 1889, making a grand total of 160,728,000 in the period from '76 to '91. For the past three years the deposit has been 6,000,000 in '92, 22,770,000 in '93 and 21,700,000 in '94. Of other fish the deposit of the last few years has been trout, 81,500 in '93 and 121,400 in '94; pike perch, 2,900,000 in '91, 14,500,000 in '92, 4,100,000 in '93 and 11,700,000 in '94; herring, 6,505,000 in '93 and 29,105,000 in '94.

"The prominent aspects of the fisheries of this lake are the large fleet of steam vessels engaged in the gill net fishery, and the large number of steamers employed in collecting fish from the pound net and other fisheries —phases of the industry which are here more important than elsewhere in the lake system; the enormous amount of gill nets used in the vessel and boat fisheries, the great development of the pound net fisheries, and the great distances to which connected lines of pound nets extend; the completeness with which the waters of the lake are scoured with fixed and movable appliances of capture; the taking of greater quantities of certain fishes than are obtained in all the other lakes combined, and the extensive trade in lake fish carried on in the cities bordering on the lake.

"Of scarcely less importance than the actual extent of the fisheries on the lake is the serious decline which has recently been observed in some of the most valuable food fishes. The discussion of the exhaustion of the fish supply of the lake, of the means to check a further diminution, and of the necessity of taking energetic measures for the increase of the fish life has been one of the most noticeable public questions pertaining to the lake fisheries in recent times, and the great interests here at stake have fully warranted the attention already given and deserve much further consideration.

The commissioner calls attention to the fact that even with a very marked increase in the quantity of fishing apparatus the catch of white fish, sturgeon and pike perches has declined. The most abundant and important fish now taken in Lake Erie is the lake herring, which is not all like the ocean herring, but resembles the white fish. The herring industry is a very important one with Sandusky fishermen.

The pike perch which term includes the wall-eyed pike or yellow pike, is the next most important fish. It is escially prominent in the fisheries of Erie, Cleveland and Sandusky. It is taken in large numbers in both pound nets and gill nets, but in larger quantities in the latter than the former and constitutes a conspicuous element in the vessel gill net fishing of Erie and Cleveland. In point of value, the common white fish ranks next to the lake herring and the blue pike, but to the fish culturist and the general fishing public, that species possesses greater interest than any other. It is the fish which has been the principal subject of fishery controversy on the lake and the one whose preservation is most desired. Owing to the marked decrease in the catch in recent years, much attention has been given to examining the condition of the fishing in recent years to determine, if possible, the cause for the serious decline. The opinion is quite generally entertained among the fishermen and dealers in some localities that the supply of white fish is being reduced by over-fishing, while others think the decline is only temporary and simply indicates a fluctuation in the catch entirely dependent on natural conditions. The decline in the catch has been most marked in the gill net fisheries and there is enormous unnecessary waste of fish in the gill net fishing owing to the methods in vogue.

Dr. Hugh M. Smith, a member of the fish commission says about the decline of white fish in Lake Erie that he had no hope that the decline could be stopped by legal regulations, although something might be accomplished in that way. In New York state, he said, much legislation for protection of fish has been enacted and yet the decline of fish in Lake Ontario has been rapid. The decrease in the catch of trout in Ontario has been remarkable since 1880, when the catch was 569,700 pounds, as compared with 41,010 pounds in 1890. Dr. Smith says that the hope of maintaining the fish in both Erie and Ontario lies in artificially stocking the waters. In the Cuyahoga fisheries the decline in the catch of both white fish and herring has been marked since 1890.

Vessel fishing is important at Cleveland. At Cleveland, Sandusky, Toledo, Port Clinton and other places in Ohio important wholesale trade in fish is carried on. The fish handled in Cuyahoga county per year is worth $8,000,000, of which about half is fresh. Sandusky has the distinction of maintaining the largest trade in fresh water of any city in the country.

Put-in-Bay has one of the most important hatcheries in the country. The eggs are squeezed from the fish by the fishermen, who are paid 40 cents per quart for them, and from these eggs, which would otherwise be a total loss, the fish are hatched by artificial means. The percentage of eggs hatched varies according to the species, being about 70 for whitefish and 50 for pike and perch.

## WAGES OF STEAMSHIP BUILDING AND CREWS.

The following report shows the rate of wages paid by Clyde builders of ocean steamships and by steamship-owners, and are printed in Consular Reports in order that reliable figures may be available for those who are specially interested in the subject of the cost of building and operating ocean steamers:

| DESCRIPTION. | WAGES. | |
|---|---|---|
| | Pence. | |
| Engineers (general) | 6½ | $0.13 |
| Pattern-makers | 6¾ | .13½ |
| Machinists (in engineer shop) | 6 | .12 |
| Boiler-makers | 8 | .16 |
| Plumbers | 8 | .16 |
| Pipe-fitters | 6¾ | .13½ |
| Shipwrights | 7½ | .15 |
| Ship-joiners | 7¼ | .14½ |
| Drillers | 8½ | .17 |
| Fitters-up | 9¼ | .18½ |
| Riveters | 10 | .20 |
| Calkers | 9 | .18 |
| Painters | 7½ | .15 |
| Furnace men | 6 | .12 |
| Sheet-iron workers (general) | 6½ | .13 |
| Coppersmiths | 7¾ | .15½ |
| Iron molders | 7½ | .15 |
| Brass molders | 8 | .16 |
| Blacksmiths | 7½ | .15 |
| Laborers | 5 | .10 |
| Frame-setters | 8½ | .17 |

The hours of labor are fifty-four per week for about forty-eight weeks in the year.

The ships are nearly all constructed of steel. Iron vessels are now as rarely built here as wooden ships.

Several of the trades mentioned are employed by the piece. These include the riveters, platers, frame-setters, fitters and calkers. The riveters work in squads, consisting of two riveters, a holder-on and a rivet boy, and they are paid at the rate of so much per hundred rivets put in. The larger the vessel, the higher the rate, and special prices are paid for riveting keels and stringer plates. A steamer of over 5,000 tons commands extra wages. On ordinary vessels, good squads (two riveters, a holder-up, and a rivet boy) will make at present about 27s. 6d. ($6.68) per day, but the average for government work is far above this. The piece men are sometimes irregular in their employment, and, if overtime is excluded, do not work more than five days per week.

The shipwrights have a standard wage of 7½d. (15 cents) per hour, but the joiners, blacksmiths, and engineers have what is known as a sliding scale.

In the case of engineers, the pay varies from 6d. (12 cents) to 6¾d. (13½ cents) per hour, blacksmiths from 6d. (12 cents) to 8d. (16 cents) per hour, and ship-joiners from 6½d. to 7½d. (12 to 15 cents) per hour.

It may be mentioned that in several of the yards, more particularly that of Messers. J. & G. Thomson, where there are now building one first-class line-of-battle ship, a first-class cruiser, and three torpedo boats, a superior class of riveters can make about 15s. (3.65) per day each.

The crews are signed for, and paid at the end of each voyage, being paid perhaps £1 ($4.86) at the time of signing.

Monthly wages of seamen on ocean steamships are:

| Description. | Wages. | |
|---|---|---|
| | £ s. d. £ s. d. | |
| Able seamen | 4 0 0 | $19 46 |
| Ordinary seamen and deck hands | 2 0 0 | 9.73 |
| Engineers: | | |
| On passenger steamers | 7 0 0 to 15 0 0 | $34 06 to 72.99 |
| On freight steamers | 7 0 0 to 16 0 0 | 34 06 to 77 86 |
| On "tramp" steamers | 11 7 0 to 15 5 0 | 55.23 to 74.20 |
| Firemen | 4 0 0 | 19.46 |
| Trimmers | 3 0 0 | 14.59 |
| Carpenters | 6 0 0 to 6 5 0 | 29.19 to 30 40 |
| On passenger steamers | 6 0 0 to 6 10 0 | 29 19 to 31.62 |
| On freight and "tramp" steamers | 6 0 0 | 29.19 |
| Stevedores: * | | |
| On passenger and freight steamers | 2 10 0 to 8 0 0 | 12 16 to 39 93 |
| On "tramp" steamers | 2 10 0 to 6 0 0 | 12 16 to 29 19 |
| Boatswains on passenger steamers | 4 15 0 | 23 11 |
| Boatswain's mate | 4 5 0 | 20 67 |

In addition to the Clyde report similar particulars are given for Trieste, Austria. Bordeaux and Havre, France, Bremen, Bremerhaven-Geestemunde, Hamburg (including Kiel and Lubeck) and Stettin, Germany, Genoa and Leghorn, Italy. Rotterdam, Netherlands. Odessa and Riga, Russia. Liverpool, Newcastle-on-Tyne, Sunderland, Belfast and Leith.

*No doubt some of our readers will be at a lo s to know why Stevedore are carried. The report of Consul Allen B. Morse, of Glasgow, probably contained the word st ward, and the tyyographical error was made at the government printing office.

## THE NICARAGUA CANAL.

At the Nicaragua Canal convention held in San Francisco last week, Senator Perkins, Congressmen Loud, Geary, Barham and Maguire, Senator Williams (resigning the chair to Professor Davidson), John T. Doyle, Captain Merry, John P. Irish, and several others spoke at length on the advantages to American commerce through an early completion of the canal under government auspices. The following petition to congress was passed unanimously.

MEMORIAL.

TO THE HONORABLE SENATE AND HOUSE OF REPRESENTATIVES, IN CONGRESS ASSEMBLED:

The Nicaragua Canal Convention assembled at San Francisco, California, respectfully represents to your august body the imperative necessity of prompt legislation which will secure the construction of the Nicaragua Canal under control of the government of the United States and for the benefit of its citizens, as well as of the commerce of the world.

Your memorialists have full confidence that the patriotism and wisdom of our government will embody therein such conservative provisions as will protect the interests of American commerce, and secure to our country the preponderating influence in this beneficial project to which it is entitled by reason of its geographical position and its influence as the Great Republic of the American continent.

We recall the fact that both great political parties have demanded favorable action on the Nicaragua Canal in their national platforms; that all presidential candidates have approved thereof, while most of our state legislatures have adopted joint resolutions of the same tenor. The American people urgently request the necessary legislation at the ensuing session of Congress.

Assured of your patriotic response of this national demand, we subscribe ourselves with high respect.

Your fellow citizens,

THE NICARAGUA CANAL CONVENTION.

THE report of Paymaster-General Edwin Stewart, of the navy, for the fiscal year ending June 30, last, is a document of unusual interest. The total amount expended on account of the naval establishment was $31,370,144.91, the largest item being $8,251,072 for payments on new shipments in ships in process of construction, other than labor.

# THE MARINE RECORD

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THE Iowa shipyard will want no more torpedo boats like the Ericsson to build. She has not yet succeeded in making the official trial trip and until she does so the firm of Dubuque builders will be out considerable money to say the least.

THERE has been issued this week from the Hydro graphic Office, Washington, D. C., a volume containing the latest and most approved sailing directions for Lake Superior, St. Mary's River and Straits of Mackinac. As is usual with the modern productions of the Hydrographic Office, the sailing directions are entitled to only favorable comment, and as this is the first work of the sort published by the department for lake use, the compilers are entitled to great credit for their accurate and well timed sailing directions. It is hoped that the publication of this volume may induce those connected with the navigation of the Great Lakes to send such information to the Hydrographic Office as will make succeeding volumes more complete. Lake Michigan, Part II of this series, is now in the press and will be followed as soon as possible by Lake Huron, Lake Erie, Lake Ontario and the St. Lawrence River as far as Montreal. There will also be a supplement to Lake Huron, viz., Georgian Bay and the Northern Channel. The hydrographer states that on account of the great amount of work in the public printing office, it has been impossible to issue this volume at an earlier day, but it is hoped that the later issues will not be so long delayed.

### THE MISSISSIPPI RIVER.

A complete revolution of the government's system of Mississippi River improvement is in prospect. Plans to that end have already been made, and some experimental work accomplished, which promises mutual benefit to the commercial interests of the entire country.

The subject of dredging the Mississippi River along its whole navigable length is now receiving the earnest attention of a government commission, the members of which are at present on an inspection tour of the big stream from St. Louis to the Gulf of Mexico. Dredging the harbors, which at this season constitute a sort of hindrance to navigation, is a matter of deep concern to all the commercial interests of the central tier of states, and the announcement that plans are being perfected whereby a regular and continuous system of keeping the Mississippi free from all obstructions, will be received with satisfaction by thousands of people who are interested in river navigation.

The commission's committee on dredges and dredging, composed of Col. Henry Fladd, of St. Louis, and Maj. B. H. Harrod, of New Orleans, some time ago authorized and caused to be constructed a dredge for improvement of the channels. At Cherokee bar, below Cairo, a new channel was made affording seven feet of navigable water where only four and one-third feet had existed before the work had begun. The second trial of the dredging machine's capacity was made at Devil's Island, just above Cape Girardeau, with the same excellent result, although the conditions existing at the latter place were pretty bad.

The new dredge is the first ever constructed in this country, although the same machine, with some modifications, has long been used upon the rivers of Germany with remarkable success.

### TO MARK OBSTRUCTIONS.

The Ward buoy for marking the location of a sunken vessel or any submarine obstruction is a device which certainly ought to be more generally carried on board of vessels. In the case of the recent casualty to the U. S. S. Cincinnati, which met with an accident in the sound while proceeding on her way to be present at the trial of the new torpedo boat Ericsson, shows that about two feet below the water line and some fifty feet from her bow on the port side there is an abrasion and the plates are sprung. Below the bilge keel amidships several plates are jarred and it was at this point that the leakage occurred which flooded some of the compartments in the double bottom. One of the blades of the port propeller is badly bent and will have to be replaced. All the officers are certain that the ship did not strike a rock, and they claim it was a sunken wreck they discovered so disastrously. Now in this case if the Ward buoy had been carried either by the sunken vessel or the war ship the casualty would not have occurred in the first place, and in the latter event the exact spot might have been accurately ascertained, a feature which will now require great expense and time to determine.

Commander Ludlow's suggestion that vessels carry a portable buoy for throwing overboard in case an obstruction is met with, as in the case of the cruiser Cincinnati, is a valuable one and worthy of consideration. The Ward buoy, with slight alteration, would be admirably suited for that purpose, as it could easily be kept in a convenient place ready for instant use, the buoy being in a most desirable shape for pitching overboard, and its construction being such that the line not being exposed to the weather, the buoy would last for many years and always be in readiness in case of an emergency. Furthermore, considering the cost for supplying the stationary and portable buoys would hardly be appreciable compared with the dangers it would certainly be the means of avoiding, we conscientiously feel that this subject should receive the attention of all interested in the welfare and safety to navigation.

Not only has Commander Ludlow endorsed the device we speak of, but at the light-house depot at Tompkinsville, N. Y., an official test made by Capt. W. S. Schley, U. S. N., inspector in charge of that district, he stated to the light-house board as follows:

"I have made a practical trial of a model of Ward's patent wreck indicating buoy. The model worked perfectly, and I consider the principle involved for indicating the location of a sunken wreck, to be an excellent one and perfectly practicable. The only limit to its usefulness would be its employment in the great depths of the ocean for which, of course, the buoy reel could not hold line enough to permit the buoy to come to the surface of the water. Taking into consideration, however, the amount of space necessary to hold line for an ordinary deep sea sounding reel of 100 fathoms (600 feet), a bouy could be made which would be neither cumberous nor expensive to indicate such a dept—600 feet. As to the operations of diving, etc., for the salvage of vessels or cargo, can hardly be conducted with good results in depths of water over 20 fathoms (120 feet) the range of the buoy's usefulness in 100 fathoms (600 feet) would be ample.

"An essential merit of the buoy is that it is perfectly automatic and is always in place on board a vessel for instant and positive resultant action in case any accident occurs which causes the vessel to sink."

"From the foregoing it may readily be judged that the wreck indicating buoy has all of the merits which its inventor claims for it and is worthy of the direct attention of all interested in shipping property.

### UNITED STATES CRUISERS.

The paper read by General Meade before the society of naval architects at New York, in which he condemns the building of cruisers like the Columbia and Minneapolis, and of small cruisers of the Detroit class, has caused much discussion in naval and merchant shipbuilding circles and it is safe to say that the bulk of opinion is opposed to the admiral's ideas.

In the first place it is held that he made an unfair comparison between the large Atlantic line steamers Campania and Lucania and the U. S. S. Columbia, the first two of 18,000 tons and the latter of 7,300. The speed of a vessel is dependent upon her size, and to build a cruiser of the size of the Campania and equip her for war purposes as is the Columbia, would bring her cost up to the enormous figure of five million dollars, a figure that no congress would consider. The machinery and coal supply of these vessels were given more than the total displacement of the Columbia.

In the entire commercial marine of the world there are but two vessels fleet enough to get out of the range of the guns of the Columbia and Minneapolis. These cruisers are built to fill the need of ships, of moderate cost and displacement and of great speed, and it is claimed they have fully realized expectations. They could not, it is true, drive ahead across the Atlantic at full speed, but they could certainly catch any ship they might sight save the two Cunarders and they would run down the White Star liner Majestic, gaining at the rate of two and one-half knots per hour. At cruising speed they carry enough coal to make three trips across the Atlantic. They draw only twenty-two and one-half feet of water, while the Campania draws twenty-seven feet and the latter is consequently unable to enter more than two or three American harbors.

The new U. S. S. cruisers might have been more speedy or might have had larger bunkering capacity but any change would have been at the expense of some other necessary quality and they well represent the balance of efficiency that is aimed at by the naval constructors.

It is further pointed out as the best evidence of the value of these two vessels, that other countries are striving desperately to equal them. France has tried it with the Dupuy De Lome; Germany has tried it with a triple screw ship, and Great Britain is now building a monster of 14,500 tons—twice as big as the Columbia—to beat her in speed. The New York and Paris are well adapted to make splendid cruisers and the navy can use them as well as the St. Louis in time of war, but there are not enough of these fleet boats thus available nor is there prospect that there will be in the near future, so that the government is required to protect itself by building its own ships.

### OHIO'S MARINE INTERESTS.

From returns compiled by W. T. Lewis, commissioner of labor statistics for Ohio, the following relative to Ohio's marine interests is of importance:

Ohio, as one of the eight states grouped about the Great Lakes, has part in a maritime commerce that, in 1892, the period of its highest development amounted to over 34,000,000 tons, valued at $400,000,000. It shares in the ownership of a fleet of nearly 4,000 vessels, costing 70,000,000, which traverse a water surface of 95,000 square miles, extending from east to west 1,300 miles. It takes foremost place in a series of vast shipbuilding interests, which, unapproached by any other section of the continent, has an invested capital of $15,000,000, and the record of an output in a single year of $7,000,000 worth of vessel property.

The Great Lakes comprise more than one-half the fresh water surface of the globe; they own over one-third of the entire merchant marine of the United States; the number of tons capacity of vessel property yearly passing in and out of Lake Erie, to and from the upper lakes, exceeds by 10,000,000 tons the entrances and clearances in the foreign trade of all United States seaports, and is greater by 3,000,000 tons than the combined foreign and coastwise tonnage of London and Liverpool, and the commerce of two Lake Erie ports separately surpass the trade of either Liverpool or Hamburg.

Lake Erie, which has an Ohio coast line of over 200 miles, is fourth in size of the five lakes and the shallowest of the entire chain. Its area is 9,960 square miles, and its dimensions 260 miles long and 65 miles at its greatest width. It has a maximum depth of 210 feet. Of the Lake States, Ohio ranks fourth in population, first in vessel ownership, first in shipbuilding and third in receipts and shipments.

In a number of other particulars, such as the building and ownership of steel tonnage, ore receipts, shipments of bituminous coal, in fisheries and in the part played in the development of lake navigation she occupies a leading position. Ohio is the first of the lake states to issue a report upon her marine interests.

THE OHIO FLEET.

Exclusive of barges and canal boats, other than steam, and of small pleasure craft, vessel property was, on December 30, 1893, owned at or controlled from Ohio ports as follows: Number of steam vessels, 328; tonnage, 267,708; number sail, 147 vessels; tonnage, 76,-

430 tons; total number of vessels, 475; total tonnage, 344,138. Division of lake tonnage by states:

| | Steam. | Sail. |
|---|---|---|
| Ohio | 267,708 | 76,430 |
| Michigan | 220,800 | 129,722 |
| New York | 186,948 | 29,684 |
| Wisconsin | 67,997 | 35,258 |
| Illinois | 49,065 | 39,303 |
| Pennsylvania | 35,657 | 1,034 |
| Minnesota | 12,830 | 11 |
| Indiana | 747 | 929 |
| Miscellaneous | 3,823 | 2,394 |
| Total | 845,606 | 314,765 |

Ohio leads all other states in steam by 46,908 tons and Michigan leads in sail by 53,290. The greater cost of steam over sail places Ohio in first position by long odds as the total value of vessel property.

Gross tons capacity of vessel property credited to leading ports: Cleveland, 218,805 steam, 52,788 sail; Buffalo, 152,967 steam, 14,594 sail; Detroit, 113,619 steam, 37,328 sail; Chicago, 48,162 steam, 38,302 sail; Milwaukee, 51,348 steam, 11,409 sail.

Ohio is credited with 31 steel propellers of a tonnage 64,938 and an average tonnage of 2,094; New York, 21, tonnage 50,652, average tonnage, 2,412; Michigan, 9, tonnage, 19,897, average tonnage, 2,210; Wisconsin, 3, tonnage, 5,536, average tonnage, 1,845; Minnesota, 3, tonnage, 4,825, average tonnage, 1,608; Pennsylvania 1, tonnage, 2,500.

The modern steel freighter of the lakes costs from $150,000 to $225,000. It carries the load of a dozen freight trains, at an average speed of from 12 to 16 miles an hour, with an expenditure of fuel of less than one ounce per ton per mile. The value of the state's vessel property is estimated at over $20,000,000.

### RECEIPTS AND SHIPMENTS.

Iron ore, grain, coal and lumber form over 90 per cent. of the lake traffic. Ohio is the point of contact between coal and iron. One-half of the iron ore produced in the United States comes from the shores of Lake Superior, and of this quantity two-thirds is received at Ohio ports. In 1893 the receipts were 4,450,996 tons, as follows: Ashtabula, 1,856,624; Cleveland, 1,265,603; Fairport, 792,515; Lorain, 171,562; Conneaut, 101,587; Toledo, 159,005; Sandusky, 4,100.

This is a falling off of over 2,000,000 tons from 1892, caused by the depression in the iron trade. The coastwise shipments of bituminous coal in 1893 amounted to 3,253,313 tons, and the foreign exports of coal were 312,653 tons. Erie, Pennsylvania is the only port outside of Ohio from which soft coal is shipped. The coastwise receipts of lumber, exclusive of logs and manufactured articles, were 319,556,000 feet, to which is added 125,000 tons of raw material not expressed in feet. Coastwise shipments of grain amounted to 16,034,539 bushels and foreign exports to 1,136,540 bushels.

### FREIGHT RATES.

Without the low rate of transportation possible only by water, the two minerals, coal and ore, now so extensively exchanged for each other at Ohio ports, could never have reached but a fraction of their present production. Ore was brought down from Lake Superior, a distance of from 800 to 1,000 miles, for as low as 80 cents during the season of 1893, and coal was carried back for 40 cents per ton. For 1893 the average rate on all freight passing in and out of Lake Superior was 1.1 mills per ton per mile, on an average distance of 800 miles. At this rate the cost of transporting the ore that came to Ohio ports would be $3,916,876. It is estimated that the average rate per ton per mile throughout the United States is 9.22 mills. The cost of transporting the same quantity of ore by rail as these figures would, therefore, have been $32,830,546, an excess over the water transportation of $28,913,670. The whole benefits enjoyed by the state in its peculiar geographical relations with these great waterways are incalculable.

### PASSENGER TRAFFIC.

A great passenger traffic, co-existing with the tide of western immigration, between 1840 and 1860, before the days of trunk line railways, has been almost forgotten. After a suspension of many years though passenger business is being permanently revived on the lines of health and pleasure-seeking. An exclusively passenger steamship, costing $500,000 and rivaling in magnificence the finest Trans-Atlantic liners, was in 1894 put into service between Buffalo and Duluth and touching at Cleveland and Detroit. By the middle of July, with the best of the season to come, it had earned $60,000 above operating expenses. Another boat of the same kind will be put on at the opening of the next season, it being the object ultimately to have six vessels plying the distance east and west of the chain of lakes. This will give a through passenger boat out of Cleveland every day in the week except one. In 1893 the traffic between Cleveland and Detroit, was 50,000 regular passengers and an equal number of excursionists. A daily service between these two cities has been in existence about 25 years. A daily passenger line between Cleveland and Buffalo carried in 1893, its second season, 9,000 passengers.

### SHIP BUILDING.

The lakes build more ships than all other sections of the country combined. From the beginning this has been an important industry in Ohio. The record of steam tonnage production in this state for the 40 years preceding 1870 was 161 vessels with a tonnage of 70,321 tons. As regards recent times the output for the year ending June 30, 1890 was 28 vessels with a tonnage of 40,800 tons.

During the calender year of 1890 one company at Cleveland turned out 9 steel steamers of 2,500 tons capacity each. The gross tonnage output of Ohio shipyards for 1891 was 13,738 tons; for 1892 it was 17,880 tons and for 1893 the amount was 8021 tons. On January 1st, 1892, there were upon the lakes 89 metal vessels having an aggregate of 127,624 net registered tons, and costing $14,502,500.

Ohio's share in this production was 43 vessels, or a net registered tonnage of 71,700 tons, costing $8,340,000. Under contract and since completed, were 32 additional steel ships, whose estimated cost was $3,896,000. Of this number, 10 valued at $1,300,000 were in shipyards of this state.

The value of the output of Ohio shipyards exceeds that of any other lake state. According to the treaty of 1817 between the United States and England, the building of men-of-war upon the Great Lakes is prohibited. The abrogation of this provision. now being agitated, will open up the way for the building of vessels upon Ohio waters for the navy.

### DOCKS.

At Ohio ports are ore-receiving docks aggregating 8,000,000 square feet, having a daily capacity of 75,000 tons, and a storage capacity of 6,000,000 tons. The cost, with equipment, is estimated at $9,000,000. By means of steam hoists vessels containing ftom 3,000 to 4,000 tons of ore can be unloaded in 12 hours. Ohio coal docks have a daily capacity of handling 36,000 tons. Revolving steam derricks dump buckets containing from 1 to 5 tons of coal into hatches of veseels, loading the largest in from two to three days. A new apparatus, placed in use last season upon the Cleveland and the Ashtabula docks picks up an entire coal car and slides its contents into the vessel's hold. The largest boats are thus loaded with from 3,000 to 4,000 tons in one day.

### FISHERIES.

Lake Erie is the largest fresh water food supply in the world. Returns from seventy-eight of the Ohio fisheries show the capital invested to be $549,000 and the number of men and boats employed in the industry to be respectively 80 and 587. The annual catch is from 70,000 to 80,000 tons. Commercially there are twenty varieties, of which herring is the most numerous, forming over 50 per cent of the whole. Among the largest consumers of the Lake Erie fish are New York city and other Atlantic Coast Ports.

### GOVERNMENT PROTECTION.

The United States Supreme Court has held the Great Lakes to be high seas, legally and commercially. They are protected under the same laws that apply to salt-water. Since 1790 there has been expended on the lakes out of the yearly river and harbor appropriation nearly $40,000,000 of which about $5,000,000 has been for the improvement of the Ohio harbors. Custom houses are located in Cleveland, Toledo and Sandusky, with branches in the smaller ports; Cleveland, Ashtabula, Fairport and Marblehead are life saving stations; Cleveland has a marine hospital and Put-in-Bay a fish hatchery. In addition are engineering inspection offices, lighthouse keepers and other federal officials stationed in Ohio ports. Recently the government, by an experiment with bottles, succeeded in determining the course of the Lake currents. Charts have been issued, which have been of great practical benefit to navigation. As a result of experiments now in progress severe storms and fog banks are to be charted.

### OHIO PORTS.

The cities and towns along the Ohio cost have a population of over 500,000. Among the cities on the lake Cleveland is second in population only to Chicago. Not alone is it the centre of Ohio's marine interests, but more than any other port, all things considered, it has contributed to the marvelous devolupment of inland navigation. The value of its vessel property is estimated at $18,000,000, a sum unapproached by any rival port, as a builder of merchant vessels it has no equal in the United States. Cleveland capital enters largely into the mining of ore on which the lake traffic thrives; into the operation of iron industries which create a market for ore, and into the prosperity of several of the smaller ports of the lakes. The Lake Carriers' Association, which controls over 80 per cent. of the lake tonnage, had its origan and still retains its headquarters there. The commerce of Cleveland in 1892 was estimated at 10,000,000.

Toledo is the great grain market of the state, ranking third among the lake cities in shipment of cereals. Her 12 elevators have a capacity of 7,157,000 bushels, and a daily capacity to receive and ship grain of 1,600,000 bushels. Sandusky is the largest fresh fish market in world, and Ashtabula the largest ore receiving port. The erection of a $5,000,000 steel plant is now being built at Lorain, and the city will improve its harbor by the expenditure of $1.000,000. All ports do more or less in the fisheries' line, but the bulk of the industry is at Sandusky and Cleveland.

### THE LAKE ERIE SAILOR.

The number of seamen on Ohio vessels is estimated at 6,500. Conditions have undergone a great change within the recent years on account of the rapid substitution of steam for sail.

The sailor proper is rapidly disappearing from the lakes. Returns from 2,784 vessel employes give the average earnings for 1893, as follows: Master, $985.60; first mates, $465; second mates, $321.63; chief engineers, $700.60; second engineers, $500.59; wheelsmen, $242.36; lookouts, $230.15; sailors, $243.08; cooks, $337.37; deckhands, $165.38; boys, $119.35. The average number of days worked by each occupation was from 223 to 227. Wages at present are lower than for many years. Out of the number questioned 52 per cent. sought work in the winter season, others went to salt water, others to the lumber camps, while many found work in the shipyards.

Out of the number interviewed as to nationality, 53 per cent was found to be foreign born, the division with respect to birthplace being as follows: Per cent. born in lake states, 43; other states, 4; Canada, 20; England, 3; Scotland, 8; Ireland, 7; Germany, 2; Newfoundland, 3; Sweden, 2; Norway, 3; the remaining 5 per cent. was divided between Wales, France, Greece and "born at sea."

The Lake Carriers' Association maintains shipping offices at a number of ports. In 1893 there was employed through the three Ohio offices 6,394 seamen.

Wages are arranged from time to time by this association, little change having taken place in ten years up to 1893, when a material reduction was made.

### DOCKMEN.

There are employed upon Ohio docks 4,000 men who load and unload vessels. While all come under the general head of stevedores, or longshoremen, there is a variety of occupations. Certain gangs of men do nothing but unload ore, while others couple this work with that of loading coal. The lumber docks have a separate force, as do also the docks where package freight is handled. Grain trimming is another distinct class of work, Dockmen are paid by the piece or by the hour. In case of the former the earnings are equally divided among the members of the gang. Except for Irish and German Americans, the work is done almost altogether by foreigners. At Ashtabula Harbor, where two-thirds of the population are alien, the nationalities represented are Swedes, Fins, Huns: Poles, Italians, Portugese and Russians. The average number of days worked in 1893 by 2,486 coal and ore shovelers was 200, and the average earnings $441.

### PRESENT CONDITIONS.

The tendency of recent years has been to large vessels and centralization of ownership. Phenomenal earnings, by boats, amounting in some instances to the original investment within a few seasons, has stimulated the production of new tonnage, which combined large carrying capacity with economy of operation. Ore companies and railroads have also gone extensively into boat buildiug. The shrinkage in the volume of traffic in 1893 produced a strong competition for business and brought freights down to an unprecedented point.

The season was disastrous, and conditions have been worse in 1894. In July it was estimated that one-third of the tonnage was lying idle. The burden has fallen upon the smaller vessels which could not compete with the large ones.

The opinion is held by conservative marine men that the day of the small owner and the ordinary wooden vessel is over, and that much of the capital invested in this class of tonnage will be a loss. With the revival of business greater achievements are expected in the lake industries. The deepening of channels from 17 to 20 feet, upon which work is now progressing, will be completed in 1896. A deep water connection with the ocean either by the St. Lawrence or the Hudson, thus opening up a Trans-Atlantic traffic, is an assured realization of the future.

One of the features of Ohio's marine importance already entered upon is the coal trade with Canada, the whole of which country, it is stated, can be supplied with fuel cheaper from this state than from any other section.

## THE ERIE CANAL.

The state engineer of New York and his deputy paid a visit this week to Cohoes, to examine into the feasibility of a scheme for canal improvement which they have had under discussion for some time, and which will, if put into execution, practically dispense with the series of sixteen locks on the Erie canal between West Troy and Cohoes, familiarly known as "The Sixteens."

The first of this series of locks, as a number of our readers are aware, is just above the junction of the Erie and Champlain canals, and the last is just above a point opposite the falls in the Mohawk River at Cohoes. With perfectly clear sailing it takes a boat from three to four hours to make the passage through these locks, but it rarely happens that all of the locks are clear, and so the average passage takes five or six hours, while at times, when trade is especially brisk, it has been known to consume double this time.

Owing to the great amount of money involved, and the fact that these locks are so closely connected, no attempt has ever been made to lengthen any of them to double length, as has been done with forty of the other seventy-two Erie locks; hence, the delay to boats with consort is very great, as they must pass all these locks singly and pay $3 per trip for extra teams to haul the disconnected boats, as well as an additional charge of $2 for a helmsman for each separate boat, as few of them carry more than a single crew.

It will thus be seen that the time nnd expense consumed in the passage of these locks is a serious matter, and forms a very considerable percentage of the time and expense of the whole trip from Buffalo to Albany.

It now takes about seven and one-half days to make the trip from Buffalo to Albany, and the saving of four hours, which could doubtless be effected by this scheme, would amount to two and one-half per cent. of the time and expenses of the trip. The project for avoiding this delay and expense is to slightly change this allignment of a short piece of the Erie canal at the head of the "Sixteens" and from the end of this change to carry the waters of the canal by means of a steel aqueduct over the few hundred feet of intervening space to a point over the Mohawk River just a little way below the falls. Here, then, instead of lowering and raising boats by the ordinary method, they will be floated into a steel lock, which, with the boats still afloat, will be raised or lowered as the case may be, in one single lift the full height of the sixteen combined locks, less the height of the two Champlain locks, or very nearly one hundred and forty feet. The operation will be controlled by machinery propelled by a turbine at the bottom of the lift, which will be actuated by a small quantity of the water which must pass from the upper to the lower level to feed the latter, but as each lifting lock will be counterweighted with an equal weight (formed principally of water), the machinery can be very light and simple, as it must only be sufficiently powerful to overcome the friction of the other parts, the counterweights doing the balance of the work.

The scheme contemplates putting two of these lifting locks side by side, each large enough to carry two boats so that propellers or other boats with single consorts would not be obliged to disconnect as they now have to in passing the "Sixteens." Thus it will be possible to "lock" boats bound in opposite directions at the same time.

Having reached the level of the Mohawk River, the boats will pass along the south or Cohoes side thereof in a specially prepared channel, protected on the river side by a concrete wall faced with steel. This channel will lead into the Cohoes dam (about 2,000 feet below the proposed new litts), where it will form a junction with the Champlain canal, which here crosses the Mohawk River. From this point south the cost of maintenance and improvements which now go to the Erie canal from the head of the "Sixteens" to its junction with the Champlain (three and one-third miles) could be spent on the Champlain canal. The cost of right of way for the new structures will be slight, as their location is above the thickly built portion of Cohoes.

There are three locks on the Champlain Canal, between the Cohoes Dam and its junction with the Erie Canal. One of these is the Guard Lock at the Cohoes Dam. The other two are connected and can be made into one at moderate cost. The immense amount of water now required for lockages through the "sixteens" will be largely reduced if the scheme is carried out and this will directly benefit all the water powers of Cohoes by increasing their available supply, which has during recent years been decreased gradually. The natural current in the canal will bring to these lifting locks a much larger volume of water than will be required for lockages and the propulsion of the turbines required to do the lifting and as it must be passed to the lower level it will form the source of power in its descent, possibly sufficient to generate enough electricity to propel all boats between Albany and Cohoes and possibly further west. The State Engineer thinks it would be a valuable power and could be made the source of considerable revenue to the state. This scheme would enable the state to abandon the three and one-third miles of the preseut Erie Canal from the head of the "sixteens" to its junction with the Champlain.

This section varies from 150 to 430 feet wide and, lying as it does, through or in close proximity to the busiest and most valuable part of Cohoes, it could doubtless be sold for a sum sufficient to cover the major part of the cost of the whole improvement, while the saving that could be effected both in maintenance and cost of operating would pay the interest on a large investment.

The scheme is regarded as being entirely feasible and based only on the somewhat new application of old, well tried and satisfactory principles and devices. Preliminary surveys will be started in a few days and it is hoped that the plans may be sufficiently developed to form the basis of reliable estimates for presentation to the next legislature, when it is expected that the recent adoption of the constitutional amendments for canal improvement will have the effect of promoting more liberal appropriations for this and other plans for canal improvement.

State Engineer Adams will also authorize surveys to be made at once, preparatory to the making of plans for a set of two locks similar to those suggested at Cohoes, to replace the five combined locks now in use at Lockport. These locks are all of single boat length and are connected one with the other like a flight of stairs and, like the "sixteens" they have always formed a puzzle in all plans for lock lengthening or canal improvement.

Mr. Adams says New York city is gradually losing its commercial supremacy because the canal improvements both as to methods of maintenance and operating have not kept pace with the progress in the methods of competing lines.

## "BANNER" SIGHT FEED LUBRICATOR.

The Lunkenheimer Company, of Cincinnati, O., are nowise behind the age in their many specialties, applicable to steam.

The "Banner" sight feed lubricator herewith illustrated, is one of the latest and best mechanical inventions designed for gas engines, air compressors and steam valve spindles of water works engines, and will also be found suitable for various other purposes, especially on account of its simplicity and compactness. It is provided with the improved Bull's Eye Sight-Feed, which does away with the usual annoyance of packing glass tubes. When a glass breaks it is only necessary to replace the broken bull's eye by using an ordinary monkey wrench.

## CORRESPONDENCE SCHOOLS.

We mentioned last month the receipt of a number of publications relating to the "Correspondence Schools," at Scranton, Pa., among these, and of most interest, are a large number of letters, nearly two hundred, written by students in respect to their experience and opinions of the system. It is the most original agency for technical education that has ever been devised, capable of an extension that has no visible limit, and portends a time when we will not set off a few of the most fortunate for education, but educate all up to the limits required in the application of the skilled arts. One effect will be to raise the standard of the ordinary courses in technical colleges and schools, because mediocrity can be attained at a tithe of the expense and in ways more congenial to most students.

The habit of writing out exercises is a good one, good in all kinds of mnemonic effort, and when to this is added the interest of a communication personally addressed, and the environment of a home, it is easy to discern the attraction of a correspondence system.

Among the papers mentioned is one sheet of examples in hydraulics that as a collection of educational problems is the best we have ever seen. When a set school book is done, and the plates made, there is an end, but in the present system a tentative course is possible. Change and improvement can go on continually; not only this, the problems submitted can be nicely graded to the requirement and capacity of the student, and can, by the facility for change, be made relevant to particular examples or practice—*Industry, San Francisco, Cal.*, October, 1894.

## NOTES.

ONE of the most interesting tables in the report is that showing the cost of maintaining in commission the various ships. The cost of the U. S. S. Chicago (second rate) was $310,613.60; the U. S. S. Yorktown (third rate), $169,907.58, and the U. S. S. Petrel (fourth rate), $103,502. These figures afford an approximate idea of the cost of maintaining vessels of the different classes. The cost of maintenance of the New York navy yard was $607,586.52; of the Pensacola navy yard, $540,341.90.

THE Clayton Air Compressor Works, Havemeyer Building, 26 Cortlandt street, New York, have sent us a copy of their newest publication on the "Uses of Compressed Air." This list cites about seventy different applications of air under pressure, including raising sunken vessels, operating steering gear, supplying divers in sub-marine operations, for working hoisting engines or cranes, moving and elevating grain, culm and other materials, unloading damp cars, etc., and is a most convincing commentary upon modern advancement in engineering, manufacturing and industrial lines. It is of especial interest to engineers, machine and construction shops and to all industries who use artesian wells. The list is mailed free on application.

IT is understood that Secretary Herbert, in his annual report, which will be made public in a few days, will make a recommendation for at least two new battleships and four torpedo boats. It was thought at one time that he would recommend one or two small cruisers to be coppersheathed, but he makes no mention of sheathed ships in his report. An earnest effort will be made to secure an appropriation for new ships at the coming session of Congress, and department officials appear hopeful of success. *The Army and Navy Journal* holds to the belief that the government, having encouraged shipbuilders to put their money in expensive plants, the nation has practically obligated itself to continue appropriations for new vessels until we have a navy commensurate with our needs. The same is to be said of the armor plate establishments. The present contracts for this material have been completed, and unless additional vessels are authorized by the coming congress, a large part of the expensive plants established by the Bethlehem Iron Works and the Carnegie Steel Works will be idle within a very few months.

## MARINE PATENTS.

529,651. Sheathing for ship's bottoms. Philip Inch, Washington, D. C., assignor of eight-fifteenths to B. N. Baker, Baltimore, Md. Original application filed June 20, 1894. Serial No. 515,142. Divided and this application filed Oct. 19, 1894. Serial No. 526,387. Claim.—In combination with the bottom of a ship or other craft a covering consisting of a composite metal composed of tin and zinc prepared with sal ammoniac and with aluminum added thereto.

529,379. Apparatus for facilitating launching lifeboats. Hervey H. Hallett, Rockland, Mass. Filed Jan. 20, 1894. Serial No. 497,490. Claim.—An apparatus for facilitating the launching of boats, the combination with an anchor and a line connecting the anchor to the shore, of an oil reservoir connected to said line, between the in-shore end of the latter and the anchor, with means for projecting the anchor, the oil reservoir and one end of said line off shore to a point outside the breakers.

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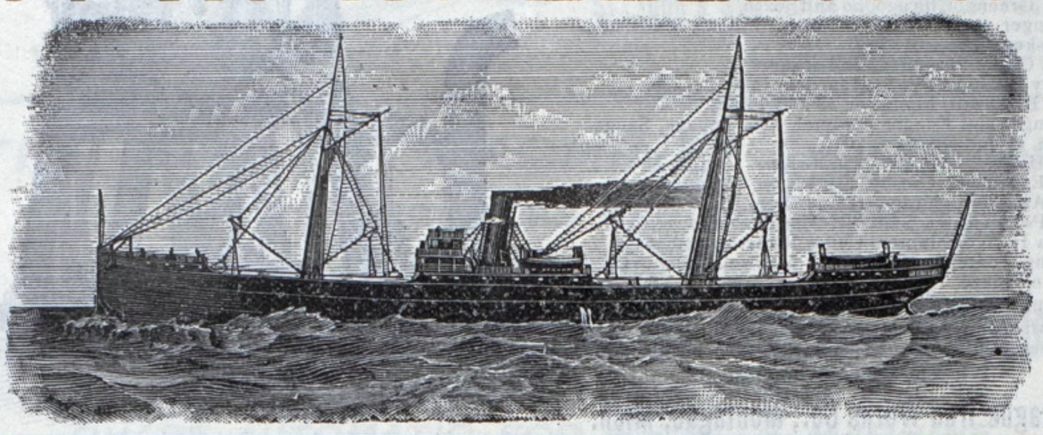

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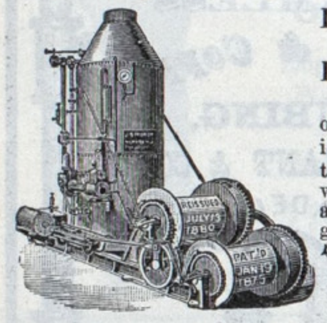

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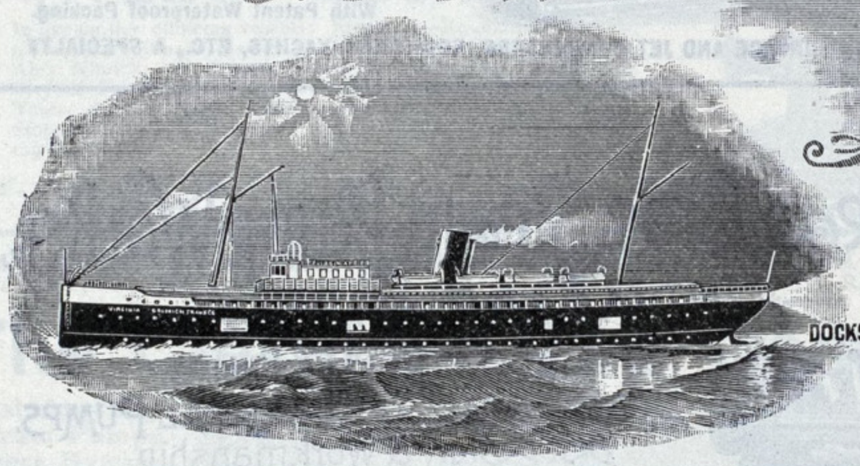

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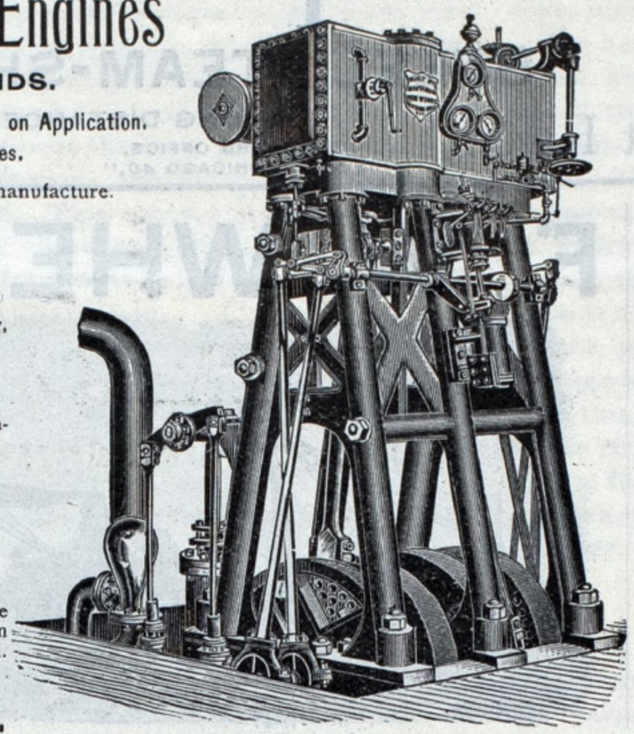

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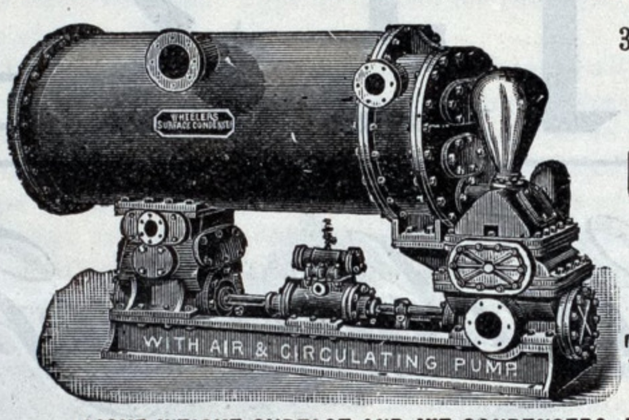


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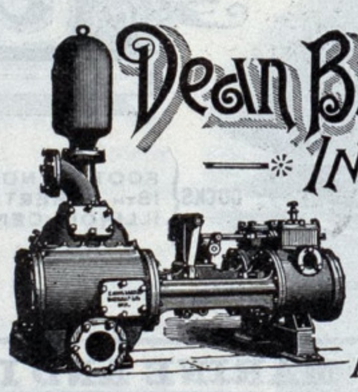

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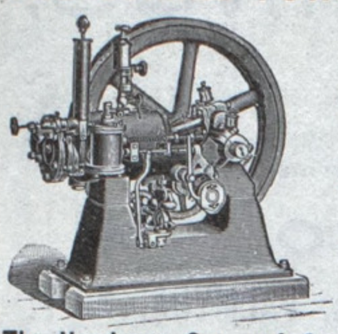

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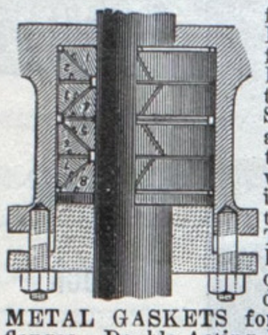

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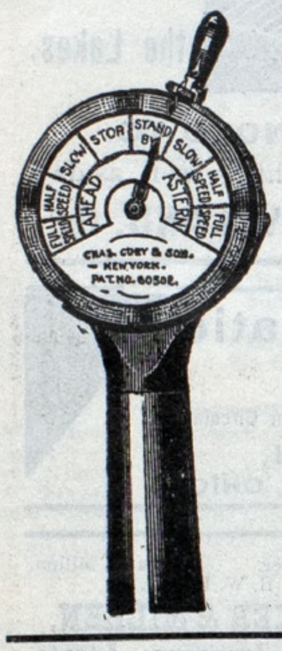


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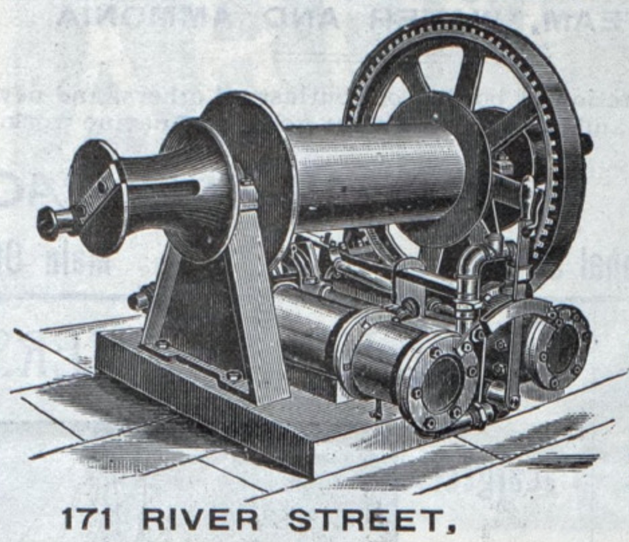

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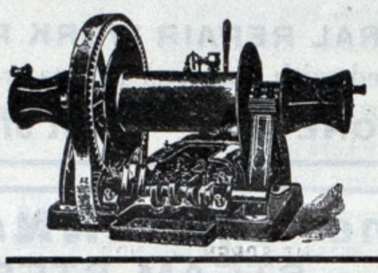

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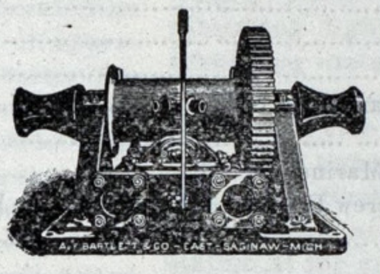


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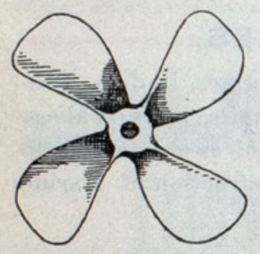

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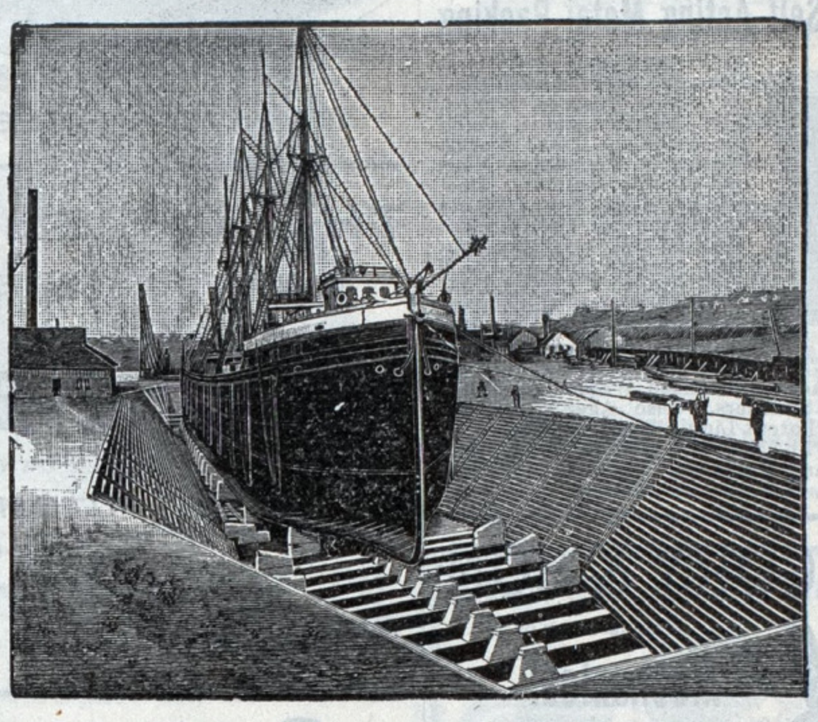

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